

506 498

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

Rec'd PAT/PTA 03 SEP 2004
 (19) World Intellectual Property Organization
 International Bureau



(43) International Publication Date
 12 September 2003 (12.09.2003)

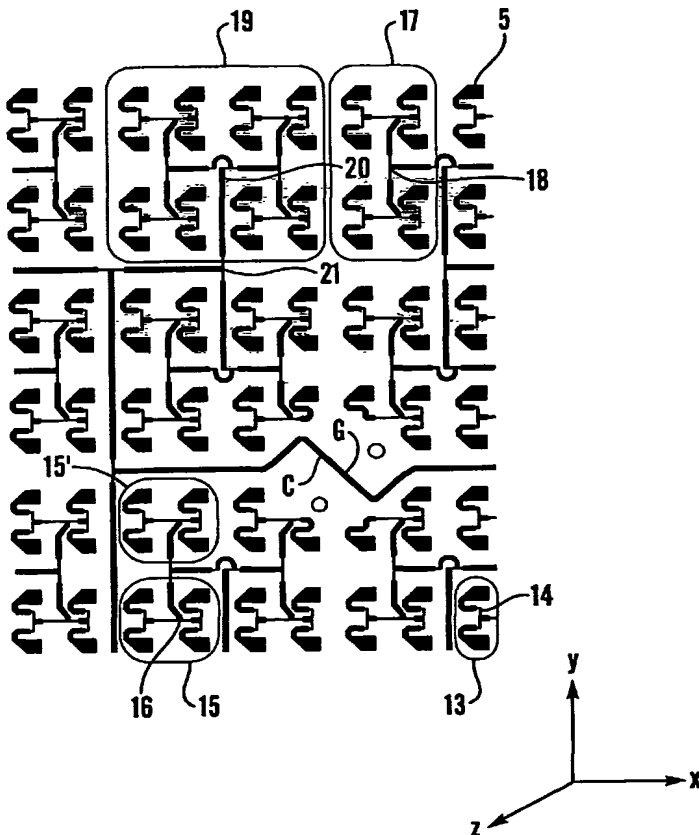
PCT

(10) International Publication Number
WO 03/075406 A1

- (51) International Patent Classification⁷: **H01Q 21/06**, 21/00
- (74) Agent: **ONSAGERS AS**; P.O. Box 6963 St. Olavs plass, N-0130 Oslo (NO).
- (21) International Application Number: **PCT/NO02/00092**
- (22) International Filing Date: **6 March 2002 (06.03.2002)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (71) Applicant (for all designated States except US): **ATRAx AS** [NO/NO]; Jerikoveien 20, N-1067 OSLO (NO).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **VELVE**, Per [NO/NO]; Bjønmyråsen 7, N-3280 TJØDALYNG (NO).
- (81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent

[Continued on next page]

(54) Title: ANTENNA



(57) Abstract: A flat antenna for receiving digital or analogue broadcasts from a satellite, comprising at least one layer of individual receiver elements, the elements in the layer being interconnected by means of conductive paths in such a manner that the signal's phase shift owing to the position of the elements in the layer is compensated for by means of length variations in the conductive paths, where the individual receiver elements are connected in pairs to a pair collector point, the pairs are connected into sub-arrays with a sub-array collector point, the sub-arrays are connected into arrays with an array collector point, and the arrays are connected into groups with a group collector point. According to the invention the conductive paths between elements, pairs, sub-arrays, arrays and/or groups comprise one or more of the following elements: straight segments extending in a first direction, straight segments extending in a second direction perpendicular to the first direction, straight segments extending on a third direction inclined or angled in relation to the first and the second directions and bent segments or compensation leads, wherein the bent segments comprise two or more straight parts and/or one or more curved parts. The antenna comprises also reflector elements lying perpendicular to the antenna's plan dimensioned and positioned in such a way that the received signal level is considerably enhanced through constructive interference.

WO 03/075406 A1

WO 03/075406 A1



(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*

INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 02/00092

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H01Q 21/06, H01Q 21/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H01Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9826642 A2 (PATES TECHNOLOGY PATENTVERWERTUNGSGESELLSCHAFT FÜR SATELLITEN- UND MODERNE INFORMATIONSTECHNOLOGIEN MBH), 25 June 1998 (25.06.98), page 9, line 25 - page 10, line 13, figures 1-7 --	1,4,8-11
X	EP 0301580 A2 (SONY CORPORATION), 1 February 1989 (01.02.89), column 8, line 24 - line 44, figure 7 --	1-2
X	EP 0345454 A1 (YAGI ANTENNA CO., LTD.), 13 December 1989 (13.12.89), column 6, line 22 - line 31; column 8, line 24 - line 29; column 8, line 44 - line 46 --	1-2

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

10 June 2002

Date of mailing of the international search report

7 -06- 2002

Name and mailing address of the ISA/

Swedish Patent Office

Box 5055, S-102 42 STOCKHOLM

Facsimile No. +46 8 666 02 86

Authorized officer

Marianne Dickman/AE

Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 02/00092

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0377999 A1 (SHOEMAKER, KEVIN O.), 18 July 1990 (18.07.90), page 5, line 27 - line 28, figure 10 --	1
A	US 5510803 A (H. ISHIZAKA ET AL.), 23 April 1996 (23.04.96), column 6, line 43 - line 63, figure 6 --	1,4,9-11
A	EP 0383597 A2 (SHARP KABUSHIKI KAISHA), 22 August 1990 (22.08.90), column 4, line 35 - line 42 --	5-6
A	US 5959588 A (B. JOHANNNISSON ET AL.), 28 Sept 1999 (28.09.99), figure 1, abstract -----	7

INTERNATIONAL SEARCH REPORT

Information on patent family members

01/05/02

International application No.

PCT/NO 02/00092

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9826642 A2	25/06/98	AU 7041498 A DE 19712510 A EP 1104587 A IL 131994 D JP 2001524276 T	15/07/98 07/01/99 06/06/01 00/00/00 27/11/01
EP 0301580 A2	01/02/89	SE 0301580 T3 AU 611174 B AU 1916788 A CA 1311555 A CN 1014383 B CN 1031159 A DE 3889027 D,T JP 1034002 A JP 2785825 B KR 9702682 B US 5087920 A JP 1061105 A JP 2629197 B JP 1109903 A JP 2551039 B JP 1155703 A JP 1158808 A JP 1158806 A JP 1160102 A	06/06/91 02/02/89 15/12/92 16/10/91 15/02/89 21/07/94 03/02/89 13/08/98 08/03/97 11/02/92 08/03/89 09/07/97 26/04/89 06/11/96 19/06/89 21/06/89 21/06/89 23/06/89
EP 0345454 A1	13/12/89	CN 1011168 B CN 1037803 A DE 68910728 D,T JP 1286602 A JP 2068275 C JP 7101811 B KR 9202227 B US 5181042 A JP 1843328 C JP 2005604 A JP 5054284 B	09/01/91 06/12/89 23/06/94 17/11/89 10/07/96 01/11/95 20/03/92 19/01/93 12/05/94 10/01/90 12/08/93
EP 0377999 A1	18/07/90	US 4914445 A	03/04/90
US 5510803 A	23/04/96	DE 4239597 A,C JP 2976681 B JP 5267930 A JP 5152840 A JP 5152843 A JP 5160634 A	03/06/93 10/11/99 15/10/93 18/06/93 18/06/93 25/06/93
EP 0383597 A2	22/08/90	AU 631599 B AU 4974090 A DE 69019194 D,T JP 2214303 A	03/12/92 23/08/90 07/12/95 27/08/90

INTERNATIONAL SEARCH REPORT

Information on patent family members

01/05/02

International application No.

PCT/NO 02/00092

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
US	5959588	A	28/09/99	AU	4852396	A	11/09/96
				EP	0785595	A	23/07/97
				EP	0811158	A	10/12/97
				JP	9214245	A	15/08/97
				SE	505796	C	13/10/97
				SE	9600206	A	20/07/97
				US	6280616	B	28/08/01
<hr/>							